

REMARKS

Claims 1, 34, 99 and 100 are amended. Claims 1-11, 16-42, 44-54 and 99-129 are in the application.

Claims 99-129 are withdrawn from further consideration. The Examiner alleges that claims 99-129 include a limitation of the non-elected species in reciting that the first electrode has an exposed surface that is being treated. However, only claims 99-102 have such language. Claims 103-129 do not. Accordingly, the Examiner's withdrawal of claims 103-129 is fundamentally in error as such claims are not directed to a non-elected species. Further regarding claims 99-102, as amended, such respectively include all of the limitations of certain claims within the elected species, and accordingly should be allowed for reasons essentially argued below with respect to allowability of claims containing such limitations of the elected species. Regardless, claims 103-129 are not of non-elected species and should be examined. Further, the undersigned notes that the Examiner has examined withdrawn claims at least as respects §112 as claims 99-103, 111, 119, 122 and 129 are rejected under §112. Regardless, for the foregoing reasons, Applicant is not required to cancel any of claims 99-129 as presented herein.

Claims 1, 34, 99-103, 111, 119, 122 and 129 are rejected under §112, second paragraph as being indefinite. The Examiner alludes that each of such claims includes a phrase including either "without" or "being void of". However, the Examiner is in error with respect to the assertion that any of

claims 101-103, 111, 119, 122 and 129 contain either the word "without" or "void". Accordingly, such claims are erroneously rejected under the grounds which the Examiner asserts.

Regarding claims 1, 34, 99 and 100, the Examiner asserts that the recited phrases are contradictory or unclear because in a subsequent step following the phrase, it is stated that a second capacitor electrode is formed over the treated oxide-containing surface. The undersigned disagrees that there is any ambiguity in the previously stated language. Nevertheless, clarifying amendments are made to claims 1, 34, 99 and 100 which overcome the Examiner's rejections in this regard. However, the added language provided in such claims in no way further restricts or narrows the claims from how they were previously worded as such limitations were inherently in such claims.

Specifically with respect to claims 1 and 99, such are amended to assert that the stated treating occurs without depositing any material onto the exposed oxide-containing surface during any of said treating. Claims 1 and 99 are further amended to explicitly recite that after said treating with at least one of the borane or the silane without depositing any material onto the exposed oxide-containing surface during any of said treating, it is then that the stated forming of the second capacitor electrode occurs. Accordingly, it is clearly stated as the undersigned believes it was before that there is no contradiction as the stated "without" phrase clearly was only with respect to the stated "treating".

Like amendments have been made to claims 34 and 100 as respects "void".

For the foregoing reasons, the Examiner §112 rejections are in error, should not have been made in the first place, and regardless should be withdrawn at least in light of Applicant's amendments to claims 1, 34, 99 and 100. Action to that end is requested.

The Examiner treated Applicant's previously amended claims as though Applicant's language added by amendment were not there, alleging that such has expedited prosecution. However, it is the previously added language which Applicant asserts distinguish Applicant's claims over the prior art and rejections upon which the Examiner has relied, and accordingly prosecution has been delayed not expedited by the Examiner's actions in this regard. The Examiner's previous rejections are merely repeated in the Office Action of May 2, 2006.

Independent claim 1 stands rejected as being anticipated by Merchant et al. Amended claim 1 recites that the treating occurs without depositing any material onto the exposed oxide-containing surface during any of such treating, and at the stated forming of a second capacitor electrode occurs thereafter. The Examiner's reliance upon Merchant et al. and rejecting Applicant's previous independent claim 1 is understood to be with respect to the disclosure of forming the Merchant et al. capacitor electrode layer 32 to be "silane oxide" at Col. 4, Ins. 34+. However, the fabrication of an oxide with silane to form the capacitor dielectric layer

inherently deposits material onto the allegedly exposed oxide-containing surface in Merchant et al. Accordingly, Applicant's amended claim 1 recites something which is not disclosed by Merchant et al., and the anticipation rejection thereof should be withdrawn. Action to that end is requested.

Further, it would not be obvious to suggest modification of Merchant et al. and arriving at Applicant's amended claim 1, as the alleged equivalent "treating" in Merchant et al. fundamentally requires a material deposition to form the capacitor dielectric layer, and "treating" without material deposition as recited in Applicant's amended independent claim 1 would defeat the purpose of forming a capacitor dielectric layer in Merchant et al. Accordingly, amended claim 1 is allowable over Merchant et al.

Applicant's independent claim 34 stands rejected as being obvious over a combination of Merchant et al. as previously applied in view of Narwankar et al. Amended claim 34 recites that the treating is void of depositing any material onto the exposed oxide-containing surface during any of said treating, and that the forming of a second capacitor electrode occurs thereafter. Merchant et al. is inapplicable to this limitation for the reasons argued above. The Narwankar et al. reference does not cure the deficiencies asserted above in this regard. Accordingly, Applicant's amended independent claim 34 recites something which is not found in either of Merchant et al. or Narwankar et al. Therefore, the combination of such references does not include all of the limitations of Applicant's

amended claim 34, and the obviousness rejection thereof should be withdrawn. Action to that end is requested.

Withdrawn claims 99 and 100 are amended in an analogous manner to the amendments made herein the claims 1 and 34, respectively. Upon allowance of claims 1 and 34 as asserted herein, claims 99 and 100 should come back into this application, as such include all of the limitations of an allowed claim to the elected species.

As asserted above, as a very minimum, claims 103-129 clearly do not read upon the non-elected species which the Examiner asserts. Accordingly, such claims must be examined in this application, and the Examiner's action in this regard is requested.

Independent claims 103 and 111 recite that the treating deposits a material onto the exposed oxide-containing surface, and that said material is of a thickness of only three monolayers or less. It is believed such added language should not be objected to for reasons which the Examiner previously objected to claims 12, 13, 15, 34 and 43. Independent claims 103 and 111 are seen to be allowable over Merchant et al. and the other references of record. As asserted above, Merchant et al. clearly contemplates significant deposition in its alleged equivalent "treating" as the very capacitor dielectric region of its capacitor is being formed by that which the Examiner finds analogous to Applicant's claimed "treating". It would in no way be obvious to suggest any modification of Merchant et al. to deposit a material of only three monolayers or less as such a layer would be

inadequate in thickness to form or function as a capacitor dielectric layer, and thereby defeat a purpose of Merchant et al. in fabricating a capacitor. Accordingly, Applicant's independent claims 103 and 111 are not obvious over Merchant et al. whether taken alone or in combination with any of the other references of record, and such claims should be allowed. Action to that end is requested.

Added independent claims 101 and 102 are species-linking claims containing the above-asserted limitations in claims 103 and 111, respectively, and are otherwise patterned after withdrawn claims 99 and 100, respectively. Upon allowance of claims 103 and 111, independent claims 101 and 102 should be allowed in this application as such include all of the limitations of an allowed claim to the elected species.

Independent claims 119 and 122 are essentially claims 4 and 5, respectively, rewritten into independent form. Original claim 4 (now claim 119) stands rejected as being anticipated by Merchant et al. Applicant disagrees and requests reconsideration.

In summarily rejecting claim 4, the Examiner asserts that Merchant et al. discloses an exposed oxide-containing surface comprising hafnium oxide of its capacitor dielectric 32. Applicant does not disagree. However, there is no disclosure or suggestion of treating such a surface with either a silane or a borane. Rather, Merchant et al. merely discloses forming its capacitor dielectric layer of any one of the various stated materials, one of which includes "silane oxide". A "silane oxide" clearly must predominantly

comprise silicon dioxide as the silane is essentially contributing silicon from the silane to the oxide being formed. There is absolutely no disclosure or suggestion whatsoever in Merchant et al. of forming its "hafnium oxide" utilizing silane, and a person of skill in the art would not be led to do so as the inclusion of silane as a deposition precursor in forming hafnium oxide would tend to form silicon oxide as opposed to hafnium oxide, and thereby defeat the purpose of forming hafnium oxide. Accordingly, there is no disclosure or suggestion of treating an exposed hafnium oxide-containing surface of a capacitor dielectric region with at least one of a borane or a silane in Merchant et al. Therefore, independent claim 119 should be allowed, and action to that end is requested.

Original claim 5 (now independent claim 122) stood rejected as being obvious over a combination of Merchant et al. and U.S. Patent No. 5,452,178 to Emesh et al. Merchant et al. is inapplicable to Applicant's independent claim 122 for analogous reasons asserted immediately above with respect to claim 4 (now claim 119). Further, even though Merchant et al. does not disclose aluminum oxide formation, it further does not disclose nor would it be suggested to employ silane in the formation of aluminum oxide as such would defeat the purpose of forming a predominant aluminum oxide layer, as the silane would contribute silicon in forming a silicon dioxide. The cited Emesh et al. does not overcome this deficiency. Accordingly, Applicant's independent claim 122 should be allowed, and action to that end is requested.

Claims 125-129 recite that the subject treating is with at least one borane and with at least one silane. Support for the same can be found in Applicant's specification at line 3 of § [0020]. None of the references can remotely be considered as suggesting treating with both.

Applicant's dependent claims should be allowed as depending from allowable base claims, and for their own recited features which are neither shown nor suggested in the cited art. Action to that end is requested.

An earnest attempt has been made to place this application into immediate condition for allowance.

Respectfully submitted,

Dated: _____

7-26-06

By: _____

Mark S. Matkin
Reg. No. 32,268